

MONTH PAGE

**Assembling
Fastening
Joining**

Automatic Submerged Arc Welding Cuts Cost of Spacer Spools 50%	Jan	104
Nickel Brazed Assembly Lowers Cost of Valves ..	Feb	28
Adhesive Bonded Aluminum Highway Signs	Feb	30
Ultrasonic Welding Difficult-to-Join Metals	Feb	138
Preform Rings Facilitate Spark Plug Brazing	Mar	24
Adhesive-Type Washer Improves Motor Design ...	May	26
Tapping Screws Eliminate Fabrication Steps	Jun	18
Worker Installs 440 Threaded Inserts an Hour	Jul	25
Double Riveting Breaks Backbone of Assembly Time and Gives 30% Overall Saving in Labor Costs ...	Aug	23
Use Finger as Wrench—with Finger-Tip Holder	Sep	22
Snap Rings Improve Compass Cutter Design	Sep	26
Self-Locking Bolts Eliminate Safety Wiring	Sep	28
Automated Setscrew Driving Nets \$29,400 Saving ..	Oct	20
Welding Replaces Brazing at 40% Time Saving ...	Oct	26
Welded Construction Is Key to the Mustang's Structural Integrity	Oct	118
Riveter Saves Need of Special Assembly Machine ..	Nov	32

Cutting Tools

Improvised Boring Tool Handles "Reaming" Job ...	Jan	24
Solve Tough Machining Job with Tougher Carbide	Jan	26
Files: Their Selection and Use	Feb	102
Boring: What Style Tool in What Style Bar?	Feb	124
Percussion Weld Surfacing Boosts Tool Life	Mar	124
Double-Boring Heads Help Triple Production	Apr	22
Holder-Insert Combination Slashes Tooling Costs ..	Apr	28
see How Trepanning Saves Time and Material	Apr	114
Extra Chaser Jumps Production and Quality	May	119
see How One Carbide Tool Firm Achieved Lower Tool Grinding Costs	Jul	86
Single Point Diamond Grooves Hardened Steel	Aug	20
Cutting Tools Pre-Set for Quick Interchange	Sep	14
Sundstrand Finds that Carbide-Tipped Taps Have Long Life	Sep	18
Turret Lathe Machining Time Reduced from 15 to 3 Minutes with Multiple Insert Tool	Oct	22

**Cutting Tools
(column)**

How Form-Relieved Cutters Should Be Used	Jan	111
Why Cutters of Profile-Sharpened Design?	Feb	129
Where Gear Milling Cutters Should Be Used	Mar	138
Milling Saws and Sawing Practice	Apr	125
How to Sharpen Cutters for Maximum Life	May	129
End Mills: A Style and Size for Any Head	Jun	127
Carbide Cutters Should Be Tailored to the Job	Jul	89
The Case for Carbide Milling Cutters	Aug	95
A Look at H-S Steels for Milling Cutters	Sep	143
The Pros and Cons of Climb Milling	Oct	135
Tips for Those Tricky Milling Problems	Nov	126
Specifying Milling Cutters	Dec	106

MONTH PAGE

**Assembling
Fastening
Joining**

Automatic Submerged Arc Welding Cuts Cost of Spacer Spools 50%	Jan	104
Nickel Brazed Assembly Lowers Cost of Valves ..	Feb	28
Adhesive Bonded Aluminum Highway Signs	Feb	30
Ultrasonic Welding Difficult-to-Join Metals	Feb	138
Preform Rings Facilitate Spark Plug Brazing	Mar	24
Adhesive-Type Washer Improves Motor Design ...	May	26
Tapping Screws Eliminate Fabrication Steps	Jun	18
Worker Installs 440 Threaded Inserts an Hour	Jul	25
Double Riveting Breaks Backbone of Assembly Time and Gives 30% Overall Saving in Labor Costs ...	Aug	23
Use Finger as Wrench—with Finger-Tip Holder	Sep	22
Snap Rings Improve Compass Cutter Design	Sep	26
Self-Locking Bolts Eliminate Safety Wiring	Sep	28
Automated Setscrew Driving Nets \$29,400 Saving ..	Oct	20
Welding Replaces Brazing at 40% Time Saving ...	Oct	26
Welded Construction Is Key to the Mustang's Structural Integrity	Oct	118
Riveter Saves Need of Special Assembly Machine ..	Nov	32

Cutting Tools

Improvised Boring Tool Handles "Reaming" Job ...	Jan	24
Solve Tough Machining Job with Tougher Carbide	Jan	26
Files: Their Selection and Use	Feb	102
Boring: What Style Tool in What Style Bar?	Feb	124
Percussion Weld Surfacing Boosts Tool Life	Mar	124
Double-Boring Heads Help Triple Production	Apr	22
Holder-Insert Combination Slashes Tooling Costs ..	Apr	28
see How Trepanning Saves Time and Material	Apr	114
Extra Chaser Jumps Production and Quality	May	119
see How One Carbide Tool Firm Achieved Lower Tool Grinding Costs	Jul	86
Single Point Diamond Grooves Hardened Steel	Aug	20
Cutting Tools Pre-Set for Quick Interchange	Sep	14
Sundstrand Finds that Carbide-Tipped Taps Have Long Life	Sep	18
Turret Lathe Machining Time Reduced from 15 to 3 Minutes with Multiple Insert Tool	Oct	22

**Cutting Tools
(column)**

How Form-Relieved Cutters Should Be Used	Jan	111
Why Cutters of Profile-Sharpened Design?	Feb	129
Where Gear Milling Cutters Should Be Used	Mar	138
Milling Saws and Sawing Practice	Apr	125
How to Sharpen Cutters for Maximum Life	May	129
End Mills: A Style and Size for Any Head	Jun	127
Carbide Cutters Should Be Tailored to the Job	Jul	89
The Case for Carbide Milling Cutters	Aug	95
A Look at H-S Steels for Milling Cutters	Sep	143
The Pros and Cons of Climb Milling	Oct	135
Tips for Those Tricky Milling Problems	Nov	126
Specifying Milling Cutters	Dec	106

		MONTH	PAGE
Data Processing	see Punch-Card System Speeds Time Study	Sep	132
	see Tool Ordering Cut to Three Steps	Oct	143
Drilling & Finishing of Holes (column)	Honing: How the Action of the Abrasive Stone Differs from the Grinding Wheel	Jan	106
	Boring: What Style Tool in What Style Bar?	Feb	124
	Boring: The Problem of the Interrupted Cut	Mar	126
	How Trepanning Saves Time and Material	Apr	114
	Gun Drilling: One-Step Production of Deep Holes	May	121
	Which Gun Drilling Method Should You Use?	Jun	123
	Jig Boring for Close Tolerances in Hole Making	Jul	92
	The Role of Tape in Jigless Hole Production	Aug	89
	Tool Control: Key to Optimum Machine Use	Sep	138
Economics in Metalworking	Give the Right Job to the Right Stamper	Jan	123
	Dream Up New Ideas and Cash in on Them	Feb	118
	Planning the Military Proposal Program	Mar	115
	Economics Dramatized at the World's Fair	May	138
	How Worthington Is Cutting Costs through Value Analysis	Jun	106
	Incentive Bonus for Group Leaders? Certainly, and Watch Your Production Rise	Jul	72
	A Stamper's Approach to Machine Justification	Aug	80
	Allis-Chalmers Chalks Up \$8 Million Savings after Four Years of Value Analysis	Sep	110
	Cost Reduction Via the Factory Budget	Sep	122
	Punch Card System Speeds Time Study Work	Sep	132
	Tackling those Profit Squeeze Items of Absenteeism and Machine Downtime	Oct	108
	How to Estimate Direct Labor Costs	Nov	104
	How to Determine Economic Lot Size	Nov	121
	Wage Payment Plans vs. Profit Squeeze	Dec	95
	see The Case for Round Ways	Dec	102
Electro-Chemical Processes	Why Grind Off Burrs? Just Wash Them Away	Mar	29
	Machining Stainless Honeycomb with Etchants	Apr	106
	see Adapting the Machine to the Job	Nov	111
Electrical Discharge Machining	EDM and Tracer Milling Help Slash Cost of Dies for Steel Extrusions	Mar	112
Expositions	see What the European Machine Tool Builders Are Doing	Jan	94
	Preview of the A.S.T.M.E. Tool Show	Apr	142
	see Report from Europe on the Italian Show	Dec	87
Flame Cutting	Low-Cost Precision Flame Cutting Through Use of Natural Gas	Aug	76
Forming Blanking Piercing Shearing	Give the Right Job to the Right Stamper	Jan	123
	Molded Rubber Boot Aids Hot Forming	Feb	24
	Shear Job Coming Up? Use Bar or Plate?	Feb	100
	Shear-Forming: Heart of New Tube Facility	Feb	121
	Tolerancing Stampings to Reduce Costs	Mar	130
	Gang Punch for Varying Angle Iron Work	Apr	30

**Forming
Blanking
Piercing
Shearing
(continued)**

	MONTH	PAGE
How to Bend Copper Alloy Tube	Apr	118
Stock Feeder Ups Press Productivity 66%	May	22
Thread Rolling Cuts Cost of Tube Nuts	Jun	15
Stamping Costs too High? Check Die Clearance	Jun	114
Extrusion Simplified Finned Parts	Jun	119
Special Setup Speeds Piercing of Holes in Irregular-Shaped Parts	Jul	15
Improved Compacting of Teflon Parts Cuts Scrap Losses in Half	Jul	22
Adjustable Gage Stop Speeds Punch Press Setup	Jul	83
One Blade Shears 80 Million Tin Plate Squares	Aug	24
Design and Production Tips for Cold Bending	Aug	82
Chrysler Rolls Ring Gears and Saves Five Lbs Per Billet	Sep	118
Produce Truck Panels Fast—on Press Brakes	Oct	24
see Welded Construction Is Key to the Mustang's Structural Integrity	Oct	118
Rolling: Big Money-Saver on Standard Transmission Mainshafts at Chrysler	Nov	114
Small Forming Machines Play Big Role in Forming Intricate Parts at Collins	Nov	118
Bulge Forming Made Highly Economical with Urethane Dies	Dec	90

**Grinding
Finishing
Deburring**

Removing Dust Generated in 8 Grinding Cycles ...	Jan	22
see IBM's Antiseptic Environment for Manufacturing to "Millionths"	Jan	88
Honing: How the Action of the Abrasive Stone Differs from the Grinding Wheel	Jan	106
Belt Grinder Cuts Finishing Costs of Casters	Feb	26
Disc Grinding Ups Quality of Missile Parts	Feb	28
Files: Their Selection and Use	Feb	106
Grind Four Tool Diameters in One Operation	Mar	26
Why Grind Off Burrs Just Wash Them Away	Mar	29
Rifle Barrels Deburred by Automatic Brushing	Mar	30
New Diamond Wheel Promises Improved Efficiency	Mar	125
Automated Grinding Includes Part Inspection	May	28
Air Tool Cuts 80% from Deburring Time	May	30
Double-Disc Grinding Ups Test Bar Output 260%	May	32
Generate Flat Precision Surfaces Fast with One-Step Lapping	May	115
Centerless Grinder Turns Out Three Times as Many Parts as Two Machines It Replaced	Jun	20
Vibration Analysis and Balancing Restore Grinders to Full Accuracy	Jun	22
How One Carbide Tool Firm Achieved Lower Tool Grinding Costs	Jul	86
Air Tools Slice Hours from Tire Mold Work	Aug	18
Arborless Wheel Increases Metal Removal 80%	Nov	19
Nylon Wheel Satin-Finishes 13,000 Piano Pedals	Nov	26

Heat Treating

Nitriding Replaces Plating and Lubrication	Mar	29
Change of Gas for Flame-Hardening Increased Productivity 35%	Jul	20
Improved Heat Treatment Makes Domestic Nail Producer More Competitive	Jul	26
TiC Treatment Extends Die Life 20 Times	Oct	26

		MONTH	PAGE
Hydraulics (column)	It's the Flow that Controls the Speed	Jan	117
	How Actuators Convert Hydraulic Energy to Mechanical Energy	Feb	133
	Adjustable Speed Drives Give Unlimited Motion ..	Mar	133
	Power Package: Key to System Performance	Apr	122
	Few Components Permit Many Circuit Variations ..	May	133
	How to Generate Multiple Motions in Sequence ...	Jun	130
	The Nature of Electrohydraulic Servo Systems	Jul	97
	Planned Maintenance Pays Its Own Way	Aug	99
	see IBM's Antiseptic Environment for Manufacturing to "Millionths"	Jan	88
	Use Audio-Visual System to Train Inspectors	Feb	128
Inspection Quality Control Measurement	see Extra Chaser Jumps Production and Quality ..	May	119
	see Vibration Analysis and Balancing Restore Grinders to Full Accuracy	Jun	22
	Simulated Defects Help Find Product Flaws	Jul	78
	Tough Inspection Ends Wasted Machining Time ...	Oct	113
	"Instant Gages" Are Key to Long Run Quality Control for Short-Run Specialist	Oct	124
	Concentricity Gaging Handled by Electronics	Dec	115
	see Drill 6 Holes at Once Through 3 Metals	Mar	120
Jigs & Fixtures	Simple Tooling Licks Distortion Problem in Machining Stator Housings	Jun	111
	Setup for Piercing Holes in Irregular Shapes	Jul	15
	The Machine Vise as a Production Fixture	Jul	80
	Adjustable Gage Stop Speeds Punch Press Setup ..	Jul	83
	see Secondary Operations Simplified	Oct	126
	see Adapting the Machine to the Job	Nov	111
Lubrication	Change in Cutting Oil Boosts Screw Machine Production of Aluminum Parts	Dec	10
Machining	Improvised Boring Tool Handles "Reaming" Job ...	Jan	24
	Solve Tough Machining Job with Tougher Carbide ..	Jan	26
	Dozen Rifle Barrels Contoured in One Hour	Feb	18
	Automatic Chucker Holds "Tenths" on Large Lots ..	Feb	115
	Tracer-Machining Triples Turbine Production	Mar	18
	How Much Does a Hole Cost? . . . Justifying the Multiple-Spindle Drill Head	Mar	102
	Drill 6 Holes at Once through 3 Metals	Mar	120
	Double-Boring Heads Triple Production	Apr	22
	Four Operations on Three Parts in One Cycle	Apr	24
	Holder-Insert Slashes Tooling Costs	Apr	28
	Research Report Points Way to Drill Malleable Iron More Economically	Apr	111
	Machining Tough Metals? Try Ultrasonics	Apr	119
	Low-Cost Machining Centers Designed for More Short-Run Profit	Apr	128
	Short-Run Parts Machined in Half the Time at IBM with Tracer-Controlled Milling	May	110
	Extra Chaser Ups Production and Quality	May	119
	Machining an "Aerospace Nightmare"	May	126
	Full Efficiency of Automatic Tapper Realized by Adding Parts Feeder	Jun	24
	Simple Tooling Ideas Lick Distortion Problem in Machining Stator Housings	Jun	111

		MONTH	PAGE
Machining (continued)	Job Shop Builds Productivity on Multiple Drilling and Tapping	Jul	84
	Roller Burnishing Improves Impeller Bearings ...	Aug	14
	Single-Point Diamond Grooves Hardened Steel ...	Aug	20
	Flow Peeling Aluminum—12 Times Faster than Conventional Machining	Aug	72
	Cutting Tools Pre-Set for Quick Interchange	Sep	14
	Turret Lathe Machining Time Reduced from 15 to 3 Minutes with Multiple-Insert Tool	Oct	22
	Tough Inspection Ends Wasted Machining Time	Oct	113
	see Secondary Operations Simplified	Oct	126
	Broach Internal Ring Gears—80% Time Saving ...	Nov	24
	Compact Mill Expedites Fine Cavity Work	Nov	28
	see Adapting the Machine to the Job	Nov	111
	Research Study Points Way to Face Mill Malleable Iron—Faster	Dec	100
Maintenance Housekeeping Safety	Removing Dust Generated in 8 Grinding Cycles ...	Jan	22
	Laboratory Analyses Stretch Change Periods for Compressor Oil	Jan	26
	Flanged Doors Eliminate Control Cabinet Danger ..	Mar	122
	Nylon Hose Ends Leaks in Hydraulic Lines	Apr	26
	Machinable Carbide Prolongs Life of Bearings	May	24
	Vibration Analysis and Balancing Restore Grinders to Full Accuracy	Jun	22
	Metallize Worn Shaft—Save Five Hours Downtime ..	Jul	18
	Planned Maintenance of Hydraulic Systems Pays Its Own Way	Aug	99
	Four Months Downtime to Repair Milling Machine Saved by Using Plastic Steel	Sep	28
Marking	Marking of Numbers on Combination Lock Wheels Is Performed at Zero Labor Cost	Dec	22
Material Handling	Chip Conveyor Serves Six Vertical Lathes	Jan	22
	Stock Feeder Ups Press Productivity 66%	May	22
	Full Efficiency of Automated Tapper Realized by Adding a Parts Feeder	Jun	24
	Driverless Tractor Releases Two Scrap Handlers and Two Lift Trucks for Other Work	Dec	14
Numerical Control	N/C Skills Taught at Vocational School	Jan	122
	see Low-Cost Machining Centers Designed for More Short-Run Profit	Apr	128
	N/C Utilization Guidelines from Lockheed	Jun	120
	The Role of Tape in Jigless Hole Production	Aug	89
	3000 Ft of Tape Directs 8-Axis Machining Center ...	Sep	135
	N/C Broaching Machine Speeds Cutter Making ...	Oct	18
	New N/C System Provides Full Zero Offset in the Z Axis	Nov	130
Pneumatics (column)	How Controlled Air Performs Work	Oct	130
	How to Select an Air Compressor	Dec	110
Stamping (column)	Give the Right Job to the Right Stamper	Jan	123
	Tolerancing Stampings to Reduce Costs	Mar	130

Table Talk (interviews)

MONTH PAGE

Free Loaders; Management's Image; and Cost Reduction Maze—Ed Cyrol, E. A. Cyrol & Co. ...	Sep	36
Management not Marketing-Sales Oriented; Engineering and Production Get Things Done; Reward New Ideas and Experiments—Harry Conn, president, W. A. Whitney Mfg. Co. ...	Oct	32
German Industry's Efforts to Maintain Status Quo; Scarcity of Labor; Demand for Tailor-Made Machines—Dr. Gerhard Schaudt, president, German Machine Tool Builders' Assn.	Nov	38
A New Manufacturing Concept; The Machine Tool Show; New Concepts and Their Effects on Production/Engineering Managers—Wallace E. Carroll, chairman of board, American Gage & Machine Co.	Dec	40

Tool Corner (column)

Overcoats and Tools—Though Identical to Your Neighbor's, Should They Cost You More?	Sep	60
A Short-Cut Method of Die Estimating	Oct	40
Tool Estimating in Job Shops—A Sink or Swim Proposition	Nov	46
Short Cuts to Estimating Drill Jig Costs	Dec	46

Tools & Dies

Machinable Carbide Dies Eliminate Galling	Jan	18
Slide Rule Determines Proper Die Clearance	Jan	20
Molded Rubber Boot Aids Hot Forming	Feb	24
see EDM and Tracer Milling Help Slash Die Costs ..	Mar	112
Draw Dies Utilize Disposable Carbide Inserts	Apr	28
Stamping Costs too High? Check Die Clearance	Jun	114
One Blade Shears 80 Million Tin Plate Squares ...	Aug	24
Hot Work Steel Triples Life of Coining Die	Aug	26
see Design Tips for Cold Bending	Aug	82
TiC Treatment Extends Die Life 20 Times	Oct	26
Urethane Dies for Bulge Forming	Dec	90

Tracing

Tracer-Controlled Machine Triples Turbine Production	Mar	18
Tracer Milling Helps Slash Die Costs	Mar	112
Short-Run Parts Machined in Half the Time at IBM with Tracer Controlled Milling	May	110

Ultrasonics (column)

Welding those Difficult-to-Join Metals	Feb	138
Machining Tough Metals? Try Ultrasonics	Apr	119

Value Analysis

How Worthington Is Cutting Costs through Value Analysis	Jun	106
Allis-Chalmers Chalks Up \$8 Million Savings after Four Years of Value Analysis	Sep	110

Welding

Automatic Submerged Arc Welding Cuts Cost of Spacer Spools 50%	Jan	104
Ultrasonic Welding Difficult-to-Join Metals	Feb	138
Percussion Weld-Surfacing Boosts Life of Cutting Tools	Mar	124
Welding Replaces Brazing at 40% Time Saving	Oct	26
Welded Construction Is Key to the Mustang's Structural Integrity	Oct	118